

Art Unit: 2826

Amendments to the Specification:

Please change the title of the invention as follows:

-- OPTICAL SEMICONDUCTOR DEVICE HAVING SEMICONDUCTOR LASER
AND ELECTROABSORPTIVE MODULATOR --

Please replace the paragraph beginning at page 2, line 2,
with the following rewritten paragraph:

-- Figs. 4 and 5 show a conventional EA-DFB device. A DFB laser (hereinafter "LD") 41 and an EA modulator 42 are formed on a substrate. A separation region 43 is provided between an upper electrode 46 of the LD 41 and an upper electrode 48 of the EA MODULATOR modulator 42. In the LD 41, a lower clad layer 53, an active layer 54, an upper clad layer (not shown), and an ohmic contact layer (not shown) to be brought into contact with the electrode are formed in this order on a substrate 52. In the EA modulator 42, the lower clad layer 53, a light absorption layer 56, the upper clad layer, and the ohmic contact layer are formed in this order on the substrate 52. In the separation region 43, the lower clad layer 53, a wave guide layer 55, the upper clad layer, and the ohmic contact layer are formed in this order on the substrate 52. An etched channel 49 is provided on sides of the LD 41 and the EA modulator 42 so as to form a ridge structure. -

Please replace the paragraph beginning at page 3, line 22,
with the following rewritten paragraph:

-- The EA-DFB device shown in Fig. 6, however, is provided with a region 64, where the upper clad layer 64 is extended such that the channel 79 in the vicinity of the incident area of the EA modulator 62 is made narrower (the separation 63 region is made wider). This structure improves the heat-radiation property in the vicinity of the incident area where

Art Unit: 2826

the rise of temperature is highest, thus enabling the input of more intense light. --

Please replace the paragraphs beginning at page 5, line 31, with the following rewritten paragraphs:

-- Since the slab is not provided in the vicinity of the incident area of the EA modulator but in the separation region such that the slab extends up to the side of the separation region, the heat-radiation property of the EA-DFB device is improved, thus enabling the input of intense light. The channel extends up to the side of the separation region, the upper clad layer along the slab is ~~removed~~ removed, and no clad layer exists under the upper electrodes so that the increase of the electrical capacity of the pad electrodes is prevented, thus improving the frequency characteristics. --

Please replace the paragraph beginning at page 7, line 30, with the following rewritten paragraph:

-- N-type indium phosphorus (InP) is used for the lower clad layer 3, indium gallium arsenic phosphorus (InGaAsP) for the active layer 4 of the LD 11 and the light absorption layer 6 of the EA 12, and p-type indium phosphorus (InP) for the upper clad layer. A channel 10, which is not provided with the clad layer 7, is provided in the LD 11 and the EA modulator 12. A slab 14[[],] includes the upper clad layer 7 which extends up to sides or edges of the EA DFB device in the separation region 13. --

Please replace the paragraph beginning at page 8, line 14, with the following rewritten paragraph:

-- The operation principle is substantially same as that of the conventional art. That is, a forward bias is applied between the upper and lower electrodes 16 and 17 to generate

Art Unit: 2826

electric current in the LD to emit ~~VW~~ CW light and a reverse bias is applied between the upper and lower electrodes 18 and 17 to change the amount of light absorbed to perform modulation. --

Please replace the paragraph beginning at page 9, line 3, with the following rewritten paragraph:

-- The operation principle is substantially same as that of the conventional art. That is, a forward bias is applied between the upper and lower electrodes to generate electric current in the LD to emit ~~VW~~ CW light and a reverse bias is applied between the upper and lower electrodes 18 and 17 to change the amount of light absorbed, making modulation. --

Please replace the paragraph beginning at page 9, line 26, with the following rewritten paragraph:

-- The operation principle is substantially same as that of the conventional art. That is, a forward bias is applied between the upper and lower electrodes to generate electric current in the LD to emit ~~VW~~ CW light and a reverse bias is applied between the upper and lower electrodes 18 and 17 to change the amount of light absorbed, thereby providing modulation. --

Please replace the paragraph beginning at page 10, line 12, with the following rewritten paragraph:

-- The operation principle is same as that of the conventional art. That is, a forward bias is applied between the upper and lower electrodes to generate electric current in the LD to emit ~~VW~~ CW light and a reverse bias is applied between the upper and lower electrodes 18 and 17 to change the amount of light absorbed, providing optical modulation. -

-